

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A process analytic system comprising:
  - a device for sensing a concentration of a combustibile species of interest in an exhaust stream;
  - a controller coupled to the device and configured to receive measurements of the concentration of the combustibile species; and
  - a blowback system coupled to the device and the controller, the blowback system being configured to responsively reverse gas flow through the device;wherein the device comprises:
  - a holder;
  - a first RTD disposed in a first protective cover, wherein the first cover is metallic and is mounted to the holder ~~and separates the first RTD from the exhaust stream;~~
  - a second RTD disposed in a second protective cover, wherein the second cover is metallic and is mounted to the holder ~~and separates the second RTD from the exhaust stream;~~ andwherein the first cover comprises a catalyst thereon which has a higher catalytic activity to the species of interest than the second cover; and
  - wherein each of the first and second RTD's are thermally coupled to its respective protective cover by a thermoconductive material.
2. (Original) The device of claim 1 wherein the first cover is formed from a tube.
3. (Original) The device of claim 1 wherein the second cover is formed as a tube.

4. (Previously Presented) The device of claim 1 wherein the catalyst is disposed on the first cover as a film.

5. (Previously Presented) The device of claim 4 wherein the film is a Group VIII noble metal catalyst.

6. (Previously Presented) The device of claim 4 wherein the film is constructed from a metal oxide combustion catalyst.

7. (Canceled)

8. (Previously Presented) The device of claim 1 wherein the catalyst comprises perovskite.

9. (Previously Presented) The device of claim 1 wherein the catalyst comprises hopcalite.

10. (Original) The device of claim 1 wherein the second cover is constructed from a catalyst-free stainless steel tube.

11. (Original) The device of claim 1 wherein at least one of the first and second cover is joined to the holder using thermally insulative material.

12. (Original) The device of claim 11 wherein the thermally insulative material is selected from the group of ceramic cement, adhesive, and high-temperature epoxy.

13. (Canceled)

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Currently amended) A solid state device for determining the concentration of oxygen in a gas phase,

the solid state device comprising:

a solid electrolyte;

a reference electrode coupled to a surface of the solid electrolyte and being exposed to a gas with a known partial pressure of oxygen; and

a working electrode including a mixed ion/electron conductor chosen from the ceria-containing fluorite group of materials, wherein the working electrode is coupled to the same surface of the solid electrolyte as the reference electrode.

24. (Original) The device of claim 23 wherein the solid electrolyte is selected from the group consisting of doped zirconia and ceria.

25. (Original) The device of claim 23 wherein the reference electrode is constructed from the group consisting of platinum, a metal oxide electrode, and a mixed conducting electrode.

26. (Original) The device of claim 25 wherein the metal oxide electrode includes perovskite structure.

27. (Original) The device of claim 25 wherein the metal oxide electrode includes oxide with fluorite structure.

28. (Original) The device of claim 23 wherein the working electrode is constructed from ceria or its solid solution doped with at least one mixed valency element.

29. (Original) The device of claim 28 wherein the mixed valency element is one of terbium and praseodymium.

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (Canceled)